

## ASCR Expectations for ALCF Early Science Program



#### DEPARTMENT OF ENERGY Office of the Secretary Federal Energy Dr. Steven Chu, Secretary Departmental Staff Regulatory Chief of Staff and Support Offices Commission Daniel B. Poneman, Deputy Secretary\* Office of the Advanced Research American Recovery & Office of the Office of the Under Secretary Projects Agency - Energy Reinvestment Act Under Secretary for Under Secretary For Nuclear Security/ Science Administrator for Assistant Secretary National Nuclear General Counsel. for Congressional & Dr. Kristina M. Johnson Dr. Steven E. Koonin Intergovernmental Affairs Security Administration Under Secretary Under Secretary for Science Thomas P. D'Agostino Assistant Secretary Chief Financial for Policy & Officer International Affairs Assistant Secretary Deputy Administrator for Energy Efficiency Office of Science for Defense Programs & Renewable Energy Chief Information Health, Safety & Deputy Administrator Assistant Secretary for Environmental Advanced Scientific for Defease Nuclear Computing Research Management Nonproliferation Chief Human Inspector General Capital Officer Assistant Secretary Deputy Administrator for Naval Reactors Forsil Energy Economic Impact Management & Diversity Biological & Environment Research Assistant Secretary for Deputy Under Secretary Nuclear Energy for Counter-terrorism Hourings Fusion Energy Science & Appeals Assistant Secretary Associate Administrator for Electricity Delivery for Defense Nuclear & Energy Reliability

Workforce Developmen

Teachers & Scientists

Civillian

Radinactive Waste

Management

Legacy Management

Security

Associate Administrator

for Emergency

Operations Associate Administrator

for Infrastructure

& Environment Associate Administratur

for Management

& Administration

Intelligence and Counterintelligence

Energy Information

Administration

Bosneville Poster

Administration

Southwestern Power

Administration

Southeastern Power

Administration

Western Area Power

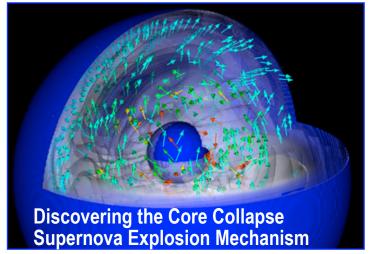
Administration

<sup>\*</sup>The Deputy Secretary also serves as the Chief Operating Officer



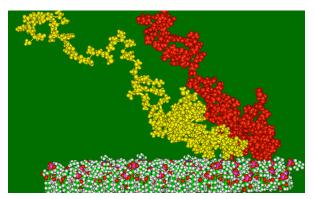
# Show us your SCIENCE! What more can you do -- with 10 PF?

ASCR designs, develops and deploys facilities so that researchers can **DO SCIENCE** in areas important to DOE.



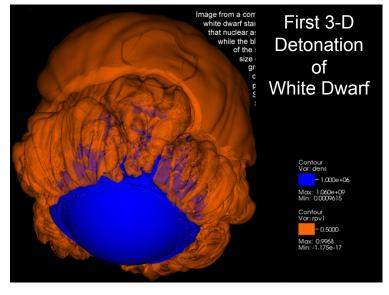








Modeling of Protofibril Structures Provides Insight into Molecular Basis of Parkinson's Disease





### **ALCF-2 Upgrade: Leap to 10 PF**



- more CPUs/node (x 4)
- more concurrency (x 5)
- faster CPUs (x 60)
- faster storage (x 2.7)
- more storage (x 3.6)
- more RAM/CPU (x 2)



### ~20 times the computing power

#### **Intrepid**

Blue Gene/P—peak 557 TF

40 racks

40,960 nodes (quad core)

**163,840 processors** (3.4 GF Peak)

80 TB RAM

8 PB storage capacity

88 GB/s storage rate

Air-cooled

#### Mira

Blue Gene/Q—peak 10 PF

48 racks -- just one row more than Intrepid

49,152 nodes (**16 core**)

**786,432 processors** (205 GF peak)

**786 TB RAM** 

28.8 PB storage capacity

240 GB/s storage rate

Water-cooled



### **ENERGY** Goal: Science on Day One

Your projects have been chosen to get **early access** and **extra assistance** to help speed your transition to the BG/Q.





## You have <TWO YEARS to make the Leap So it's Full Speed Ahead!

FIRST ESP Workshop October 2010

ESP complete July 2012

**Test and Development Machine** Summer 2012

10 PF Machine goal: SCIENCE on DAY ONE









Take a deep breath...



...and fill the available space with science!